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CLERK U S DISTRICT COURT	
DISTRICT OF ARIZONA	
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IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF ARIZONA

UNITED STATES OF AMERICA,)	CR-01-1011-PHX-FJM
)	
Plaintiff,)	ORDER
)	
vs.)	
)	
JULIO ADALBERTO HIDALGO,)	
SR.; JULIO HIDALGO, JR.,)	
)	
Defendants.)	

The defendants challenge the admissibility of the opinions of a forensic document examiner on whether certain writings and handprintings are theirs. We have read Hidalgo Sr.'s motion for a Daubert hearing regarding handwriting analysis (doc. 18), Hidalgo, Jr.'s joinder, the Government's memorandum in opposition, Hidalgo, Sr.'s reply, Hidalgo, Sr.'s notice of expert witness testimony, the Government's notice of expert witness testimony, the Government's notice of supplementary testimony, the Government's second notice of supplementary testimony, Hidalgo, Sr.'s supplemental memorandum re: admissibility of handwriting analysis, and the

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1 Government's post-Daubert hearing brief in support of
2 proffered handwriting expert.

3 We granted the defendants' motion for a *Daubert* hearing
4 and heard testimony from William J. Flynn, a forensic document
5 examiner, and Dr. Moshe Kam, a professor of electrical
6 engineering, on behalf of the government's position. We also
7 heard the testimony of Dr. Michael J. Saks, a professor of
8 psychology and law, on behalf of the defendants. We first
9 summarize the evidence and our findings. We then describe our
10 understanding of the law on the issue in the post-Daubert,
11 post-Kumho setting. We then reach our conclusions.

12 I.

13 A.

14 Handwriting analysis is based upon the premise that each
15 person's handwriting is unique. (See Flynn Aff. at 2-3).
16 This assumption is key because it is uniqueness that allows a
17 handwriting analyst to establish authorship against all other
18 writers in the world. To establish uniqueness, the government
19 points to a recent study of Professor Sargur Srihari. Sargur
20 Srihari et al., *Individuality of Handwriting*, 47 J. Forensic
21 Sci. 856 (2002). Professor Srihari's research team scanned
22 the handwriting samples of 1,500 individuals into a computer.
23 The computer was then programmed to analyze and compare the
24 samples based on a variety of features such as slant, height,
25 the number of interior contours, and the number of vertical
26 slope components. When the computer was asked to match the
27 exemplars, it was able to do so with a 98% accuracy rate. The
28

1 government argues that this study inferentially proves that
2 handwriting is unique because otherwise the computer would not
3 have been able to differentiate among the exemplars. Yet the
4 Srihari study fails to establish uniqueness. At most, we can
5 reasonably infer that among 1,500 writers, very few write in
6 a similar way.¹

7 The government also points to the existence of several
8 studies arguably proving that the writing of identical twins,
9 while strikingly similar, is nonetheless distinguishable.
10 Horatio H. Newman et al., *Twins: A Study of Heredity and*
11 *Environment* (1937); Mary S. Beacom, *A Study of Handwriting by*
12 *Twins and Other Persons of Multiple Births*, 5 J. Forensic Sci.
13 121 (1960); D.J. Gamble, *The Handwriting of Identical Twins*,
14 13 Can. Soc'y Forensic Sci. J. 11 (1980); J.H. Wanscher, *The*
15 *Hereditary Background of Handwriting: An Investigation of the*
16 *Handwritings of Mono and Dizygotic Twins*, 18 Acta Psychol. Et
17 Neurology 23. Each of the four studies in evidence was based
18 on an evaluation of the handwriting of identical twins. In
19 only two of these was the evaluator blind as to whether the
20 exemplars were those of an identical twin. The two blind
21 studies were designed to determine whether handwriting has a
22 genetic basis, not whether the handwriting of identical twins

23
24 ¹The government also points to the existence of the
25 Forensic Information System for Handwriting ("FISH"), a
26 computer system in use by the United States Secret Service.
27 Evidently, the Secret Service has been able to match the
28 handwriting of several individuals who have written
threatening letters to government officials. The papers
describing FISH do not allow us to draw a meaningful
conclusion about FISH's effectiveness.

1 is distinguishable. Because of this, the studies adopted
2 classification schemes that are too imprecise for our
3 purposes. One study classified the writing of thirteen out of
4 twenty-nine identical twins as "identical[]" or very
5 similar[]."2 Wanscher, *supra*, at 360. The other grouped many
6 twins as writing "alike." Newman, *supra*, at 125-26. We thus
7 do not know whether any of those who wrote "alike," wrote
8 identically.

9 That leaves us with the two non-blind studies directed at
10 the question of whether identical twins ever write
11 identically. The authors reported differences in the
12 handwriting of identical twins. Yet in each study a single
13 evaluator applied an intrinsically subjective protocol.
14 Because forensic document examiners assert that no person
15 writes the same way twice (see Flynn Aff. at 2-3), it is hard
16 to say how the examiners accurately concluded that none of the
17 participants wrote identically. Forensic document examiners
18 were not asked to distinguish between the handwriting of
19 identical twins in any of these studies. We therefore do not
20 know whether the handwriting of identical twins is
21 sufficiently differentiated for practical purposes.

22 We are, of course, aware that it would be impossible to
23 analyze and compare the handwriting of every literate person.
24 Uniqueness must therefore be demonstrated, if at all,

26 ²This study notes Francis Galton's 1883 report of a pair
27 of identical twins who wrote so much alike that neither twin
28 was able to recognize his own writing. Wanscher, *supra* at
350.

1 inferentially. Although we can speculate as to one way in
2 which such a demonstration might be made,³ no such showing is
3 in evidence. At the end of the day, we are left with the
4 assertion of the forensic document examination community that,
5 in their experience, handwriting is unique.

6 B.

7 The government has been more successful in establishing
8 that forensic document examiners possess skills that exceed
9 those of lay persons. A study by Professor Moshe Kam is the
10 most useful. Moshe Kam et al., *Writer Identification by*
11 *Professional Document Examiners*, 42 J. Forensic Sci. 778
12 (1997). Professor Kam asked more than one hundred forensic
13 document examiners and forty-one non-professionals to
14 determine the authorship of six unknown documents from a
15 library of twenty-four exemplars. Although professionals and
16 non-professionals made correct matches at about the same rate,
17 the false positive rate for professionals was 6.5% compared to
18 38.3% for non-professionals. In other words, the non-experts
19 were almost six times as likely to make a match where no such
20 match should have been made.⁴

21

22 ³One way would be a mathematically rigorous application
23 of the product rule, which proposes that if a forensic
24 document examiner finds two rare traits in an individual's
25 handwriting, the examiner can multiply the rates to determine
the rate at which one can expect to find both of them.

26 ⁴The government has submitted a re-analysis by Professor
27 Kam which compares the accuracy rates of professionals with
28 printed documents in contrast to cursive or mixed writing.
The false positive error rate for printed documents was 9.3%
compared to 5.5% for non-printed documents. Professor Kam

1 Additional studies by Professor Kam and others provide
2 support for the conclusion that forensic document examiners
3 are more accurate than laypersons. Professor Kam conducted a
4 study on the ability of forensic document examiners to
5 identify signatures.⁵ Moshe Kam et al., *Writer Identification*
6 *by Professional Document Examiners*, 42 J. Forensic Sci. 778
7 (1997). Forensic document examiners demonstrated a false
8 positive error rate of just .5%.

9 A study conducted in Australia by Bryan Found and Doug
10 Rogers reported that forensic document examiners were correct
11 91.5% of the time in declaring a signature a forgery. Bryan
12 Found & Doug Rogers, *Revision and Corrective Package:*
13 *Signature Trial*, (2001) (unpublished CD-ROM). When the
14 examiners identified a signature as genuine, they were correct
15 98.2% of the time.⁶

16

17

18 states that this increase is not statistically significant.
19 He was unable to include the results of three of the packets
20 that were used in the original study. This caused the false
21 positive rate for all documents to go from 6.5% in the
22 original study to a little over 7% in the re-analysis.

23 ⁵Professor Kam also conducted a pilot study that examined
24 the identification skills of seven FBI-trained forensic
25 document examiners vis-a-vis ten lay persons. Moshe Kam et
26 al., *Proficiency of Professional Document Examiners in Writer*
27 *Identification*, 39 J. Forensic Sci. 5 (1994). The
28 professional group made four errors while the non-professional
group made 247.

29 ⁶Accuracy was 55.3% when participants stated an opinion
30 with regard to a disguised signature. A disguised signature
31 is one in which the author has tried to make it appear as a
32 forgery but is in fact genuine.

1 The defendants argue that notwithstanding these studies
2 there is no significant evidence of the reliability of
3 handwriting identification. The defense position is not that
4 handwriting identification is unreliable, but instead that the
5 government has not demonstrated its reliability.⁷ Professor
6 Saks made it clear that he is "agnostic" on whether document
7 examiners are reliable. The defense contends that the Kam
8 studies provided the participants with unrealistically easy
9 tasks. We have considered this question and conclude that the
10 tasks were sufficiently rigorous. Moreover, the task
11 presented in Professor Kam's second study is closely analogous
12 to the task in this case.

13 The defendants point to the lack of incentives for non-
14 professionals. They argue that professional document
15 examiners knew that the status of their profession rode on the
16 outcome of these tests. They therefore had every incentive to
17 be cautious in declaring matches. Non-professionals, in
18 contrast, had no incentive to be careful and were thus more
19 cavalier in declaring matches. This disparity, the argument
20 goes, explains why professionals made fewer false positive
21 errors than non-professionals. Professor Saks asserts that the
22 effect of lack of incentives can be seen in the bi-modality of

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24 ⁷The defense does, however, argue that the results
25 reported by Collaborative Testing Services, Inc. ("CTS") raise
26 serious questions as to the reliability of handwriting
27 analysis. CTS issues tests by which individuals or
28 laboratories may evaluate their forensic skills. CTS reports
the results that are returned to it. Since this data lacks a
control group and other hallmarks of scientific rigor, we
place no significant weight on the CTS data.

1 the data in Professor Kam's pilot study. Professor Saks
2 claims that while most non-professionals performed poorly, a
3 few performed as well as professionals. He contends that this
4 shows that some non-professionals were motivated while others
5 were not, and that motivation positively correlates with
6 outcome.

7 We do not agree. The worst professionals made two
8 errors. The best non-professionals made about nine errors,
9 while the worst non-professionals made about forty-four
10 errors. Even the worst professionals clearly outperformed the
11 best non-professionals. We conclude that the effect, if any,
12 of incentives has not been sufficiently developed to affect
13 our analysis. For example, Professor Kam conducted another
14 study in which non-professionals were divided into four groups
15 and exposed to four different monetary incentive schemes.
16 Moshe Kam et al., *Effects of Monetary Incentives on*
17 *Performance of Non-Professionals in Document-Examination*
18 *Proficiency Tests*, 43 J. Forensic Sci. 1000 (1998). He found
19 no statistically significant differences among the groups.
20 While a small monetary reward would not be as strong an
21 incentive as the prospect of losing one's professional
22 livelihood, the available evidence suggests that this concern
23 might go to the weight rather than the admissibility of the
24 evidence.

25 **II.**

26 Rule 702 of the Federal Rules of Evidence governs the
27 admissibility of expert testimony and provides that:

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1 If scientific, technical, or other specialized
2 knowledge will assist the trier of fact to
3 understand the evidence or to determine a fact in
4 issue, a witness qualified as an expert by
5 knowledge, skill, experience, training, or
6 education, may testify thereto in the form of an
opinion or otherwise, if (1) the testimony is based
upon sufficient facts or data, (2) the testimony is
the product of reliable principles and methods, and
(3) the witness has applied the principles and
methods reliably to the facts of the case.

7 Fed. R. Evid. 702. The Supreme Court has directed district
8 courts to serve as gatekeepers and to determine the
9 reliability of expert testimony within the meaning of Rule 702
10 before admitting it. *Daubert v. Merrell Dow Pharm., Inc.*, 509
11 U.S. 579, 597 (1993); *Kumho Tire Co. v. Carmichael*, 526 U.S.
12 137, 141 (1999).

13 In *Daubert*, the Supreme Court identified five factors to
14 consider in admitting or excluding expert testimony: (1)
15 whether the theory or technique can be or has been tested; (2)
16 whether it has been subjected to peer review and publication;
17 (3) the known or potential error rate; (4) the existence and
18 maintenance of standards controlling the technique's
19 operation; and (5) its general acceptance within the
20 scientific community. *Daubert*, 509 U.S. at 593-94. These
21 factors are neither mandatory nor exclusive. The district
22 court can base its reliability determination on "*Daubert's*
23 factors or any other set of reasonable reliability criteria."
24 *Kumho Tire Co.*, 526 U.S. at 158. Moreover, a district court
25 enjoys "broad latitude" both in deciding how to go about
26 determining the reliability of challenged expert testimony and
27 in its ultimate reliability determination. *Id.* at 142.

1 Kumho made it clear that the Daubert gatekeeping
2 obligation applies not only to "scientific" testimony, but to
3 all expert testimony, including technical and other
4 "nonscientific" expert testimony. *Id.* at 141. In determining
5 the reliability of nonscientific expert testimony, a district
6 court may consider one or more of the factors outlined in
7 *Daubert*. *Id.* However, the "test of reliability is
8 'flexible.'" *Id.* Thus, "Daubert's list of specific factors
9 neither necessarily nor exclusively applies to all experts or
10 in every case." *Id.* Instead "the gatekeeping inquiry must be
11 tied to the facts of a particular case." *Id.* at 150 (internal
12 quotation marks omitted).

13 Before *Daubert*, handwriting analysis testimony was
14 admissible under the *Frye* general acceptance standard. See,
15 e.g., *United States v. Fleishman*, 684 F.2d 1329, 1337 (9th
16 Cir. 1982) ("It is undisputed that handwriting analysis is a
17 science in which expert testimony assists a jury."); *Robles v.*
18 *United States*, 279 F.2d 401, 404-05 (9th Cir. 1960) ("It is
19 well settled that an expert in handwriting may testify and
20 state his opinion as to whether different documents or
21 signatures were written by the same person" (internal
22 quotation marks omitted)). *Daubert* and *Kumho*, however, have
23 changed the general rules of admissibility. Because general
24 acceptance is now but one of many factors a trial court may
25 consider, it no longer serves as the *sine qua non* of
26 admissibility. Courts are now confronting challenges to
27 testimony, as here, whose admissibility had long been settled.

28

1 The United States Court of Appeals for the Ninth Circuit
2 has not addressed the issue of whether handwriting analysis is
3 admissible under *Daubert* and *Kumho*. Only two federal circuit
4 courts have considered the issue post-*Kumho*. Neither of them
5 discussed the *Daubert* factors or any other indicia of
6 reliability in determining that it was not an abuse of
7 discretion to admit the challenged expert testimony. *United*
8 *States v. Paul*, 175 F.3d 906 (11th Cir. 1999); *United States*
9 *v. Jolivet*, 224 F.3d 902 (8th Cir. 2000).

10 We have located nine district court cases that have
11 directly addressed the issue of whether the expert testimony
12 of a forensic document examiner is admissible under *Daubert*
13 and *Kumho*. No consensus has emerged. Only two courts have
14 found the testimony to be reliable and fully admissible.
15 *United States v. Gricco*, No. 01-90, 2002 U.S. Dist. LEXIS 7564
16 (E.D. Pa. Apr. 26, 2002); *United States v. Richmond*, No. 00-
17 321, 2001 U.S. Dist. LEXIS 15769 (E.D. La. Sept. 21, 2001).
18 Four courts have determined that the forensic document
19 examiner's testimony was not based on sufficiently reliable
20 principles and methodologies under *Daubert/Kumho* and fully
21 excluded the expert's testimony. *United States v. Lewis*, No.
22 2:02-00042, 2002 U.S. Dist. LEXIS 17062 (S.D. W. Va. Sept. 11,
23 2002); *United States v. Brewer*, No. 01 CR 892, 2002 U.S. Dist.
24 LEXIS 6689 (N.D. Ill. Apr. 12, 2002); *United States v. Saelee*,
25 162 F. Supp. 2d 1097 (D. Ala. 2001); *United States v. Fujii*,
26 152 F. Supp. 2d 939 (N.D. Ill. 2000). Three courts reached a
27 middle position, permitting the forensic document examiner to
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1 testify as to particular similarities and dissimilarities
2 between the documents, but excluding the ultimate opinion as
3 to authorship. *United States v. Rutherford*, 104 F. Supp. 2d
4 1190 (D. Neb. 2000); *United States v. Santillan*, No. CR-96-
5 40169, 1999 U.S. Dist. LEXIS 21611 (N.D. Cal. Dec. 3, 1999);
6 *United States v. Hines*, 55 F. Supp. 2d 62 (D. Mass. 1999).

7
8 III.

9 The Government proposes to have Mr. Flynn testify, based
10 upon his examination and comparison of questioned items and
11 known documents, that (1) Hidalgo, Jr. executed the bulk of
12 the handprintings and text appearing on the original uniform
13 residential loan application from Nelson Hernandez, (2)
14 Hidalgo, Jr. probably executed the writings on a 1994 W2 form,
15 (3) there are indications that Hidalgo, Sr. executed the
16 handprintings and text appearing on the original request for
17 verification of employment form addressed to Sandoval Masonry
18 dated February 10, 1997, (4) neither Hidalgo, Jr. nor Hidalgo,
19 Sr. could be identified as having written the writings and
20 text on the original request for verification of employment
21 form addressed to R.C. Nutrition Center dated February 6, 1996
22 and the request for verification of employment form addressed
23 to El Tanampa Restaurant dated June 21, 1995, and (5) he can
24 read certain typewriting on the 1994 W2 form.

25 The evidence produced at the *Daubert* hearing and the
26 reports and affidavits received support different findings as
27 to whether an expert can testify regarding the identity of
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1 handwriting and handprinting, on the one hand, or something
2 less than that, on the other.

3 A. Opinion Testimony as to Authorship of Questioned
4 Documents

5 The Government offers the uniqueness of handwriting as a
6 scientific principle. But there is no evidence before me to
7 support the thesis that handwriting is unique. The Srihari
8 study supports the proposition that very few people write in
9 a similar way. Mr. Flynn asserts the uniqueness of
10 handwriting but while the hypothesis is testable within the
11 meaning of *Daubert*, it has not been fairly tested. It is true
12 that the uniqueness principle is generally accepted in the
13 forensic document examiner field, but that in itself is
14 insufficient under *Daubert*. Peer review in this area cannot
15 be said to be any different from its general acceptance in the
16 forensic document examiner community. Indeed, not even
17 Professor Kam posited the theory that handwriting is unique.
18 His research supports the proposition that document examiners
19 are better than lay persons in excluding false positives.
20 Professor Kam understands that while this may be helpful to a
21 jury, it does not support the uniqueness principle upon which
22 identification opinion testimony is based.

23 We therefore find and conclude that the principle of
24 uniqueness of handwriting or handprinting fails to satisfy a
25 *Daubert/Kumho* analysis. If the principle of uniqueness could
26 be proven, then one would know how to analyze handwriting or
27 handprinting with an error rate of zero percent. But there is
28 no support for the proposition, nor does the government

1 contend that document examiners have a zero percent error
2 rate.

3 The foundation for a document examiner's identification
4 between a known document and a questioned document is the
5 principle of uniqueness. Because the principle of uniqueness
6 is without empirical support, we conclude that a document
7 examiner will not be permitted to testify that the maker of a
8 known document is the maker of the questioned document. Nor
9 will a document examiner be able to testify as to identity in
10 terms of probabilities.

11 B. *The Mechanics and Characteristics of Handwriting,*
12 *Including Similarities*

13 Because the Government has failed to prove the principle
14 of uniqueness, we have excluded any expert opinion testimony
15 that the handwriting or handprinting on any questioned
16 document is in fact the handwriting or handprinting of the
17 defendants. In contrast, the Government has proven that
18 forensic document examiners possess skills that are better
19 than those of lay persons in identifying the authorship of
20 questioned documents. While it is true that professionals and
21 non-professionals make correct matches at about the same rate,
22 the false positive rate for non-professionals is about six
23 times that of professionals.

24 Professor Kam tested the hypothesis that questioned
25 document examiners possess a skill different from that of lay
26 persons. I find and conclude that his conclusion is credible.
27 This proposition has been tested, and has been subject to peer
28 review and publication. Error rates have been established,

1 and, of course, there has been general acceptance. *Kumho*
2 instructs us that where the basis for an expert's testimony is
3 not scientific (as here),⁸ "the relevant reliability concerns
4 may focus upon personal knowledge or experience." 526 U.S. at
5 150. And, as the Court acknowledged, *id.* at 151, "some of
6 *Daubert's* questions can help to evaluate the reliability even
7 of experienced-based testimony."

8 It is intuitive that someone who is trained in and has
9 experience in the analysis of handwriting is likely to be
10 better at it than someone who is not. The Government's
11 evidence in this case proves this to be so. Mr. Flynn uses a
12 methodology which is the standard of the American Society of
13 Testing and Materials. He first examines the known writings
14 and then makes a side-by-side comparison to the questioned
15 writings. He sees whether they have general features in
16 common. He then sees if they have individual patterns. He
17 evaluates strokes and characteristics, and the personal
18 alphabets of the known and questioned writings. While the
19 failure of proof of the uniqueness principle would preclude
20 him from rendering an opinion of identity, he could, based
21 upon his experience and training, testify to the mechanics and
22 characteristics of handwriting, his methodology, and his
23 comparisons of similarities and dissimilarities between the
24 defendants' known writings and those of the questioned
25 documents. He could point out to the jury things that the

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27 ⁸In contrast to the uniqueness principle, which purports
28 to be based on science (see part III(A) *supra*), a document
examiner's superior skill is based on training and experience.

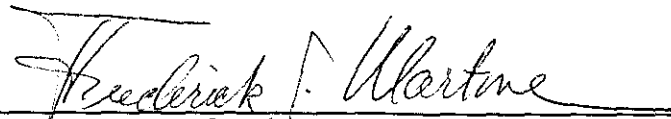
1 jury might not see on its own. It would then be left to the
2 jury to make the ultimate finding of identity or non-identity.

3 IV.

4 For the foregoing reasons, we GRANT the defendants'
5 motion to exclude expert opinion testimony that the
6 handwriting on the questioned documents is in fact the
7 handwriting of a defendant. We DENY the defendants' motion to
8 exclude testimony on the mechanics and characteristics of
9 handwriting or handprinting, methodology, comparisons of
10 similarities and dissimilarities, and any other factors that
11 would be helpful to the jury in making a finding of identity
12 or non-identity, short of an ultimate opinion.

13 We acknowledge that today's ruling is applicable to a
14 case set for trial in the fall of 2002. We are not unmindful
15 of the fact that in light of the pressure brought to bear on
16 forensic document examination (and other areas of expertise)
17 by *Daubert* and *Kumho*, further research, testing, and
18 publication are likely to proceed at an accelerated pace and
19 thus future rulings on this topic may be influenced by future
20 developments.

21 DATED this 5TH day of November, 2002.

22
23 
24 Frederick J. Martone
25 United States District Judge
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